

Thermally induced diphenylalanine cyclization in solid phase

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Abstract

© 2016, Akadémiai Kiadó, Budapest, Hungary. The reaction of cyclization of diphenylalanine in solid phase under heating was studied, which is a stage in formation of various nanostructures from this dipeptide. The temperature ranges of the reaction as well as of dehydration of clathrate of diphenylalanine with water were determined. Kinetic parameters of cyclization were estimated within the approaches of the non-isothermal kinetics ("model-free" kinetics and linear regression methods for detection of topochemical equation). The product of diphenylalanine cyclization was characterized by X-ray powder diffractometry, FTIR spectroscopy and TG/DSC analysis. Crystallization of diphenylalanine and cyclo(diphenylalanine) from methanol solutions was studied using atomic force microscopy. The results obtained may be useful for the design of new nanomaterials based on diphenylalanine at high temperatures.

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Keywords

Atomic force microscopy, Diphenylalanine, Nanostructures, Reaction of cyclization, Thermal analysis, X-ray powder diffraction